URETHRECTOMY, PARTIAL OR COMPLETE, AS A METHOD FOR RADICAL TREATMENT OF RUPTURE OF THE URETHRA, FISTULA, OR ORGANIC STRICTURE.[1]

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IN the early part of the past summer my friend Dr. William Wile, of Danbury, Conn., related to me a method for the immediate and radical treatment of traumatic rupture of the deep urethra, which, for its *rationale*, simplicity and immediate success, so much impressed me that I then and there determined that when the first opportunity offered I would put the same principles into practice on a pathological case that he did on one of a traumatic character; for, it seemed to me, that they were equally applicable and efficacious in both.

The citation of Wile's case was substantially thus: A middle-aged farmer, in one of the suburban towns of Danbury, Conn., one evening fell from a hay-loft, in his fall striking on his perineum, astride the sharp edge of a cart-wheel. This was followed by great distress in the perineum, and an incessant desire to urinate; but nothing, except, pure blood passed the meatus. Dr. Wile was called in consultation, early the following morning. At this time there was an enormous infiltration into the cellular tissues of the perineum, discoloration of the integument, and inability to introduce any sort of tube through the urethra, to empty the now, greatly-distended bladder.

On section of the perineum it was discovered that the deep urethra was completely torn in two, the distal end, being *in situ* while the proximal, had so far retracted into the loose, infiltrated tissues in the direction of the pubic arch, that it could not be found.

[1] Read before section of Genito-Urinary Surgery, New York Academy of Medicine, November 8, 1892.

Now Wile, not to be frustrated, made a supra-pubic incision, and passing a flexible catheter through the vesical urethra from within, soon brought the lost end into view.

He now sewed up the rent in the bladder and abdomen above, and closed the rent in the urethral canal by two courses, of fine catgut sutures; the tissues in the soft parts, being approximated with the same material. No constitutional disturbance followed; the incision in the perineum closing, by primary union, and no stenotic contraction, of the urinary passage at any time followed.

I reasoned, if we can safely resect segments of tubular structures in other parts of the body, notably those of the alimentary canal, why not the membranous urethra? At any rate, in all cases of traumatic rupture, or fistula, do a plastic operation, and restore the continuity of the canal. It occurred to me, also, that this procedure must have a place, in certain old, organic strictures, which resist gradual dilatation, and demand for their palliation an internal or external divisionof the dense calloused mass through which the pin-hole passage permits the urine to dribble away.

In my cogitations I naturally turned to the text books on surgery, and the authors on this special subject for information; but in this direction I was disappointed, for, exclusive of scattered cases of partial restoration of the urethra by autoplastic flap-sliding, as recommended by Szymanowsky, I could find nothing, as there are no cases on record, in English or American publications, that I could find, of total resection of the entire calibre of the urethra for fistula; or even immediate restoration of the canal after traumatic rupture, by direct perineal incision.

In the meantime, in the month of June of this year (1892), two cases entered my service at the Harlem Hospital, having been sent in to me by physicians in the neighborhood for operation; which I regarded as appropriate to test my theories on.

First Case: Urethral Fistula.—J. C., aged 70 years. General condition bad. Much emaciated, and had a care-worn, melancholy expression. But we could find no evidence of organic disease. Locally he was in a pitiable state; as, immediately behind the bulb, in the deep urethra, there was a fistula as large as a crow's quill, through

which his urine continuously escaped, causing an extensive eczematous state of the scrotum, perineum and inner surfaces of the thighs as far down as the knees. His clothing covering the parts was continually saturated with foul-smelling urine. He had had this fistula, which was of blenorrhagic origin, since the summer of 1865, or a little more than twenty-seven years, during which time all his urine was drained through this new opening. Until six months before he came to us, he had perfect control of the bladder, but now incontinence was continuous; and the thick, ropy deposit on the bandages made it evident that the case was complicated with prostatic and vesical catarrh.

There were three strictures in the pendulous urethra. By a long and patient trial, twice repeated, I was enabled to pass a fine whalebone, filiform bougie through the urethra and the fistulous sinus, on to the bladder.

This, certainly, was not a very promising case for a novel surgical operation.

Having prepared the parts internally and externally, by a thorough disinfection, and after he had rested a week, an operation was undertaken for his relief, with a view of securing the continuity of the urethra by a total resection of the entire calloused segment of it.

Having been anæsthetized with ether, a filiform whalebone bougie was passed into the bladder and utilized as a guide.

As the dark outline of this could be seen through the aperture of the fistula it was not difficult to introduce a sharp-pointed, strong bistoury, and split it in the direction of the raphé, through the thick, calloused wall of the urethra, for about one centimeter, in the direction of the prostate, until the stricture was entirely freed in that direction. At this juncture the blade of the scalpel was withdrawn, and the distal wall of the urethra similarly treated.

The extent of cicatricial induration at the bulb was rather less than in the preceding, but of a denser composition.

All the circumjacent tissues were now stripped away from the perforated stricture, and it was, by a clean, transverse incision at either end, completely removed *en bloc*. So far there had been but very little hæmorrhage.

Now, looking into the hiatus made by the exsected stricture, the proximal end of the urethra could be seen, retracted to within five or six millimetres of the deep perineal fascia. This incision here had gone through normal tissues. At the distal opening there was yet

evidence of remaining stenosis. But, fearing to sacrifice any more urethral tissue, after it was divided by a crucial incision, its interior cicatricial substance was cut away with a scissors curved on the flat. At this stage, the bougie was withdrawn, and a long, straight, probe-pointed scalpel passed in; and, from the aperture below, was carried forward until it appeared at the meatus in its transit, dividing those penile strictures on the floor of the urethra, and giving it a turn on its own axis, its withdrawal secured the free division of such stenotic patches as were lodged along the roof of the canal. Effective hæmostasis, with thorough irrigation, completed this stage of operation.

The next step was to secure, by an autoplastic procedure, the reconstruction and continuity of the urethra. Having first ascertained that a number eighteen (English scale) steel sound could freely enter the bladder, without force, it was withdrawn; and with a No. 10 sound in the urethra, a circular seam of medium strong catgut interrupted sutures was made, bringing into immediate contact the separated, gaping edges, without tension.

In introducing the suture, the cellular and muscular layers only were included.

The peri-urethral, cellular, muscular and aponeurotic tissues were closed by a continuous line of catgut sutures separately. The edges of the skin were brought firmly together by twisted silk. No drainage was employed.

This completed the second stage of the operation. The next, the third, embraced the final flushing of the closed wound of the urethra and bladder, and application of the dressings.

A No. 10 hard-rubber sound was left in the urethra.

Had our man not had incontinence of urine I believe it would have been better to have catheterized intermittently, than to have established drainage; for, it is well known that the vesical mucous membrane will not tolerate with impunity any sort of foreign body over a considerable period of time without giving rise to suppuration, cystitis, urethral fever or other serious constitutional derangements.

In this case, while the wound in the perineum, with the exception of one small end, united by primary union, yet this man, while the catheter was in the bladder, presented such marked and persistent psychical disturbances that the question of sending him to an institution of lunacy was raised by his friends. All this time he had no fever, and as soon as the catheter was permanently withdrawn, and his

urine carried off intermittently, all those phenomena of mental derangement disappeared, as if by magic. The small pin-hole opening through the perineum was easily closed by denuding and suturing it.

Our patient was dismissed from the hospital September 15. At this time he had again recovered perfect control of his bladder, and urinated without pain or difficulty.

His urine is now of normal quantity, quality and specific gravity.

A No. 14 sound (English) passes in and out of the bladder, without difficulty. With a view of preventing an annular contraction at the point of suturing he has been advised to procure a set of bougies and pass one from time to time into the bladder, in the meantime employing the utmost caution in effecting perfect asepsis in his manipulations.

His general health has been entirely restored, and he has gained more than forty pounds in flesh since the operation.

Second Case: Recurrent Organic Stricture.—Patient, 48 years old, has had stricture for more than twenty years, and been treated by internal urethrotomy, divulsion and gradual dilatation, the primary pathological condition in each, after varying intervals, relapsing.

At time of entrance to hospital the urine was charged with mucus; frequently voided, particularly during the night, and always with pain. Was prepared to submit to any species of treatment which promised relief. His stricture, as the preceding, was of a gonorrhœal origin. In this case, on the most thorough exploration, but one stricture could be discovered. This was so completely closed that nothing but the smallest-sized whalebone bougie could be passed through; and not even this until several protracted attempts were made.

The same preparatory line of treatment was instituted as in the preceding case; the whalebone also being utilized as a guide to cut on. First an incision running diagonally to the long axis of the body was made, through dense schirrous tissue, until the guide was reached, when a linear incision was made in either direction through the stricture, which was but little more than one centimetre in length.

When this was laid widely open it was freely tunneled out from below by cutting away a furrow through the calloused urethra, the convexity of which was above, with its base below.

A No. 12 catheter was now passed through and the entire passage flushed, after which it was removed and the urethra permitted to remain empty. The flow of the urethra was now reconstructed by approximating the peri-urethral tissues from below, the structures from within, out, being replaced by three rows of catgut sutures.

There was no reaction after operation. Patient's urine was drawn with catheter as often as appeared necessary. The local wound closed in by primary union, and within two weeks from time of operation it had solidly united, when a No. 14 sound easily entered the bladder without any difficulty, and he urinated with the greatest ease and comfort. He left the hospital on the 20th of August, and so far we have heard nothing from him; hence cannot vouch for the quality or permanence of result.

Observations and Conclusions.—It is almost needless to say that, for many obvious reasons, these operations were undertaken with some hesitancy and trepidation, as I have always believed that serious surgical operations should have something more to commend or justify their performance than their uniqueness or novelty, however skilfully performed. But, having carefully studied the anatomico-physiological qualities of the normal urethra, and considered just what constitutes the pathological foundation of all traumatic or organic strictures or fistulæ, I could conceive of no serious objection to total resection of the entire calibre of the urethra with an immediate homologous urethrorraphy in old fistulæ, or traumatic rupture; nor to external urethrotomy; partial, linear resection of the calloused mass, and *immediate reconstruction* of the urethral floor with the cellular tissues. It might be said that the membranous urethra, in its long, as well as in its lateral diameters, is lax, elastic and very distensible.

Dr. Otis was the first to demonstrate its enormous lateral distensile properties, thereby opening the way to successful lithotrity.

I am not acquainted with any author who has called attention to this property of elongation, possessed by that segment of the urethra wholly enveloped by the perineal muscles. It also may be added that the principles of this operation are precisely the same as those employed in the management of all organic strictures.

Through a certain course of pathological changes, generally consequent on gonorrhœa, the male urethral mucous membrane undergoes degenerative changes, resulting in a destruction of its epithelium layers and a fibrosis of its outerlying tissues.

That this is clearly understood is evident by the measures commonly instituted for the relief of a condition, which art is powerless to perfectly cure. We may widen a narrowed, strictured passage by immediate or gradual dilatation, split it with a blade from within or without; burn an opening through it by potash or electrolysis, yet, with all, complete retrogressive changes to the normal state, cannot be said to ever occur, though the immediate inconvenience which it occasions usually disappears.

It might be argued that a urethral floor composed of cellular elements will never assimilate to mucous membrane, and a contracted condition, must follow this operation, worse than that we have endeavored to relieve.

John Hunter, Baron Dupuytren, Laennec and Villumé long ago called attention to the close resemblance of the membrane investing a urinary fistula and a mucous one.[1] Cruveilhier and Chassier admit the possibility of the reproduction of mucous membranes after they have suffered loss of substance.[2] Andral claimed that in all these cases the reproduced mucous membrane was the result of transformation of the cellular elements.[3]

Dieffenbach, in his time, demonstrated by the Taliäcotian method, which has been recently revived, that he succeeded in curing a large number of perineal fistulæ of urethra; though in those days nothing was known of anæsthetics or antiseptics. Thus it appears that the fundamental objections cannot stand against this autoplastic procedure in the surgery of the urethra.[4]

Happily, since the two cases here recorded were dismissed from the hospital I have read with much satisfaction Guyon's essay, which appeared in the *Gazette Hebdomedaire*, May 14, 1892, entitled, "Resection Partial of the Perineal Urethra, followed by Restoration, Entire and Complete."

It may not be amiss here to give the substance of his article, as it has a direct bearing on the subject under consideration, and is, in many particulars, a peculiarly unique production.

In the beginning, he says that partial resection of the urethra

[1] Treatise on the Blood. Leçons sur l'Anat.-Path.

[2] Essai sur l' Anat.-Path.

[3] Andral, Anat.-Path.

[4] John Swift's Translation. Dublin Jour. of Med. Sciences, Vol. X, p. 279.

has occupied a very moderate rank until very recently; that Roqués, one of his internes, has been able to collect but sixty-four cases from all sources. Forty-nine of these were complete, and fifteen incomplete. After describing the precise manual for operation, he tells us that Championniére treated a case of complete traumatic rupture of the urethra by perineal section and immediate approximation, with entire success. There were nine cases of lesions of the perineal urethra treated in his own wards; six by himself. In all these cases operation was resorted to only when the passage of instruments was quite impossible. Four were traumatic and two blenorrhagic. In two, there were fistulæ. In all, the entire calloused mass was removed and prompt union followed. Patients ages were from 14 years to 50. The youngest leaving the service could pass a No. 30 sound (French), and the adults from No. 50 to 60.

In no instance had there been any troublesome relapses, though he admits that he advised them to pass a sound on themselves from time to time.

RÉSUMÉ.—(*a*) It seems then, from the foregoing, that in all cases of traumatic rupture of the perineal urethra, the tissues should be laid open at as early a date as possible; and the continuity of the lumen of the urethra should be then entirely restored by a urethrorraphy.

(*b*) In those urethral, perineal fistulæ which resist dilatation or other tentative measures, regardless as to whether they are of a traumatic or blenorrhagic origin, they should be resected and continuity restored in the passage by homologous approximation of the separated edges, the hiatus remaining being obliterated, through linear elongation of the fibres of the muscular coat.

(*c*) With those strictures, rebellious to tentative methods, not appropriate for internal urethrotomy or divulsion, when they are divided by an external incision, the occasion should be utilized to hew a gutter through the cicatricial tissues, and to reconstruct the floor of the canal with the adjacent connective tissues.

(*d*) In all cases the most rigorous asepsis should be employed; and the aim, in every case, should be to secure non-suppurative, primary union.